

THE VIRGINIA EARTHQUAKE OF SEPTEMBER 5, 1919.

By EDGAR W. WOOLARD, Assist. Observer.

[Dated: Weather Bureau, Washington, D. C., Dec., 1919.]

Distinct earthquake shocks were felt over the Blue Ridge region of Warren and Rappahannock counties, Virginia, about 10 p. m. local standard "summer" time, September 5, 1919, or 2 h. Greenwich civil time, September 6. The shocks were apparently of greatest intensity in Harmony Hollow, a valley to the east of Dickeys Hill, between the latter and the crest of the main Blue Ridge and a few miles south of Front Royal, or near Arco. This same area was the one of highest intensity in the earthquake of April 9, 1918. A report, by Dr. T. L. Watson, of the Virginia Geological Survey, on the geology of this region as related to the two disturbances will appear in the *Bulletin* of the Seismological Society of America.

The quake appears to have been entirely local. It was distinctly registered at Washington, D. C., on the seismographs of the U. S. Weather Bureau and Georgetown University, as a very small brief disturbance; it was not noticeable to the senses, however, more than 40 miles from Front Royal. Inquiries directed to Winchester, Strasburg, Woodstock, Mount Weather, Rector-town, and Waterlick failed to locate anyone who had felt the shocks.

There was a gradual onset of trembling shocks, intensity 4 (adapted Rossi-Forel), one mile north of Front Royal, there being two shocks, each lasting about three minutes, accompanied by a rumbling sound; many people

felt these. The disturbance was felt, intensity 4, at Riverton, and by many people at Limeton; also, one-half mile southeast of Reager. Trembling shocks, intensity 3, lasting three minutes, were felt by many people in and near Cedarville, but no damage was done. At Arco, rocking shocks, intensity 8, with loud rumbling sound were reported by J. A. Silman, who states that "this earthquake caused a good bit of excitement; some never-failing springs are dry since, and the rocks fell from chimneys, this occurring about one-half mile north of Arco; springs around in the neighborhood of 2 miles were muddy next day; there have been slight quakes since, but I haven't the exact date." Chas. McClure was writing in his office in Front Royal "when there was a sudden heavy jar, and a sound as if something had fallen in some part of the building." Near Arco he found that "considerable excitement ensued from repeated severe shocks accompanied on the first shock by an explosive sound as if of a heavy blast, and on the second shock about an hour later, a still heavier explosion of the same character. Several subsequent shocks are reported." Plaster fell from walls, and glassware from shelves. Children were panic-stricken, and one was thrown into convulsions. A widespread phenomenon was that of many clear streams suddenly becoming, and remaining, turbid, although there had been no rain.

